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USE OF A HAIR TREATMENT PRODUCT
[Verwendung eines Mittels zur Haarbehandlung]

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The present invention relates to the use of a product, particularly, a hair conditioning product, which imparts improved wet and dry combability, fullness, and hold, as well as shine, for human hair.

Conditioners for human hair have been known to the art for a long time. As a rule, they contain quaternary ammonium compounds exhibiting, at least, one long-chained alkyl or alkenyl group, as well as, potentially, polymers.

As a rule, such products are formulated as aqueous dispersions, or emulsions, micro-emulsions, gels, or also in the form of aerosols, and used as hair rinses, conditioning treatments, etc.

An overview of the familiar hair treatment products and their compositions which are rinsed out of the hair as "rinse-off" products or remain in the hair as "leave-on" products are found in the monograph of K. Schrader, Principles and Cosmetic Prescriptions, 2nd Edition, (1989), pp 722 to 781, particularly, pp 728 to 737.

In spite of these familiar compositions, there still exists a need for hair treatment products with improved hair care properties.

It has now been found that a hair treatment product that improved the characteristics of hair when applied topically is obtained if a mixture of, at least, one mono- and/or oligo saccharide and green tea extract is added to such a product of an aqueous basis.

Saccharose, glucose, fructose, lactose, maltose, galactose, cellobiose, fucose, mannose, erythrose, rhamnose, etc., are preferably

*Number in the margin indicates pagination in the foreign text.

used as mono and/or oligosaccharides in accordance with the invention.

It is expedient to use these sugars as mixtures, for instance, as components of natural substances.

A preferred natural substance containing mono- and disaccharides is honey, for instance. Starch hydrolisates are also appropriate.

The percentage in the overall composition respectively relates to the mono or oligosaccharide percentage.

For example, 0.1 to 20 wt.%, particularly, 0.25 to 10 wt.% represent appropriate quantities. 0.5 to 5 wt.% of the overall composition are especially preferred.

The pulverulent tea extract employed is obtained from leaves, leaf shoots, and tender stems of the tea shrub *Camelia sinensis* or *Camelia oleifera* through an aqueous or aqueous/alcoholic extraction and subsequent spray drying.

The green tea represents the kinds *Thea sinensis* or *Thea assamica* in contrast to black tea of non-fermented products.

An overview of the biological and pharmacological effect of green tea and its components, e.g., is found in an article by A. Pistorius, SÖFW Journal, Volume 122, No. 7/1996, pp 468-471 to which reference will be made.

The green tea extract content in the compositions that are used in accordance with the invention is variable. It, preferably, lies at 0.1 to 10, preferably, 0.25 to 5, particularly, 0.5 to 2.5 wt.% when computed in relation to the overall composition of the product and the pulverulent extract.

The use of flavonol derivatives in hair care products, which, among other things, can be derived from green tea, is already familiar to the art from DE A3320539A1.

The combination that is used in accordance with the invention can be deduced from this printed publication.

Naturally, the hair treatment products which are used in accordance with the invention may also additionally contain components that are standard ingredients in these products; to avoid redundancies, reference is again made to K. Schrader, "Basic Principles and Formulations of Cosmetic Products", Volume 2 (1989), pp. 722-771.

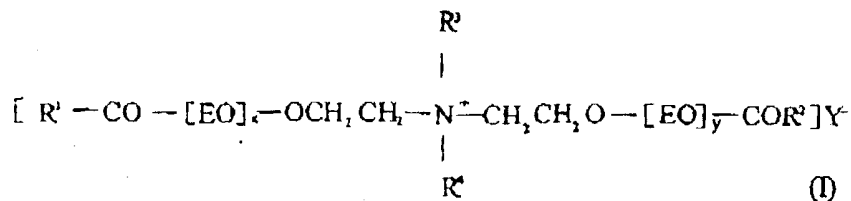
The quaternary ammonium compounds with one or two alkyl or alkenyl groups with 10 to 22 carbon atoms in the molecule, particularly, in a quantity of 0.1 to 10, preferably, 0.25 to 7.5, especially preferably, 0.5 to 5 wt.% of the overall composition, which are generally known to the art, are appropriate additives in such compositions.

Appropriate long-chained quaternary ammonium compounds that can be used either alone or in a mixture, particularly include cetyl trimethyl ammonium chloride, dimethyl dicetyl ammonium chloride, trimethyl cetyl ammonium bromide, behenyl trimonium chloride, stearyl trimethyl ammonium chloride, dimethyl stearyl benzyl ammonium chloride, benzyl tetradecyl dimethyl ammonium chloride, dimethyl dihydrated talgammonium chloride, lauryl pyridinium chloride, lauryl dimethyl benzyl ammonium chloride, lauryl trimethyl ammonium chloride, tris-(oligo oxyethyl)alkyl ammonium phosphate, cetyl pyridinium chloride, etc. In principle, all ammonium

compounds listed in the CTFA International Cosmetic Ingredient Dictionary under the designation "Quaternium" are appropriate.

Long-chained ammonium compounds with one or two ester groups in the molecule, the so-called ester quats, are of excellent suitability.

These, for instance, preferably correspond with the general formula



in which R^1 and R^2 , respectively, stand for a possibly hydroxy-substituted C_8 - C_{22} alkyl or alkenyl group, R^3 and R^4 stand for a C_1 - C_3 alkyl group, or a group $-\text{CH}_2-\text{CH}_2-\text{O}-[\text{EO}]_z-\text{H}$, and x , y , and z stand for 0 to 5, and Y^- stands for an anion. /3

Preferred residues R^1 and R^2 are C_{12} - C_{18} -alkyl- and oleyl residues; the residue R^3 is a methyl group, and the residue R^4 is a hydroxy ethyl group, x , y , and z , preferably, are 0 or 1; Y^- , preferably, is a methosulfate-, chloride-, or phosphate anion.

The preferred quantity of this compound of Formula I is between about 0.1 to about 20, particularly, about 0.5 to 15, above all, about 1 to 10 wt.%, computed based on the hair treatment product.

These compounds are generally known to the art and, in particular, they are, for instance, being marketed under the brand names "Schercoquat[®]", "Dehquart[®] F30", and "Tetranyl[®]".

Their use in hair care products is especially described in WO 94/06899A1, EP 0614349B1, and EP 0680314B1.

Further additives, for instance, include synthetic or natural hair-conditioning polymers, preferably, in a quantity of 0.1 to 2.5, particularly, 0.25 to 1.5 wt.% of the overall composition.

The cationic (co-)polymers known under the CTFA designation "polyquaternium" alone or also in mixtures with non-ionic, anionic, and/or amphoteric polymers, for instance, those of the "amphomer[®]" type, are especially preferred.

Apart from the longstanding quaternary cellulose derivatives of the "polymer[®] JR" type, appropriate cationic polymers particularly include quaternized homo- and copolymers of dimethyl diallyl ammonium chloride, as they are marketed under the brand name "Merquat[®]", quaternary vinyl pyrrolidone copolymers, particularly, with dialkyl amino alkyl (meth)acrylates, as they are familiar under the name "Gafquat[®]", copolymerisates of vinyl pyrrolidone and vinyl imidazolinium methochloride offered under the trade name "Luviquat[®]", polyamino polyamide derivatives, for instance, copolymers of adipic acid dimethyl amino hydroxy propyl diethylene triamine, as they are distributed under the name "Cartaretine[®]F", as well as also bisquaternary long-chained ammonium compounds of the urea structure described in US-A 4157388 which are on the market under the trade name "Mirapol[®]A15".

In this context, reference is made to the cation-active polymers mentioned in DE 2521960A1, DE 2811010A1, DE 3044738A1, and DE 3217059A1, and to the products that are described on pages 3 to 7 of EP 337354A1. Mixtures of various cationic polymers can also be used.

Appropriate cationic polymers also include the graft copolymerisates of organopolysiloxanes and polyethyloxazoline that were disclosed in EP 640643A2.

An especially preferred graft copolymerisate of the represented kind exhibits a total molecular weight of about 50 000 to approximately 500 000, preferably, about 80 000 to about 300 000, particularly, about 100 000 Daltons, whereas the molecular weight of the oxazoline segment is about 2 500 to approximately 7 500, preferably, about 4 000 to approximately 6 000, especially, about 5 000 Dalton segments, i.e., its molecular percentage is at 20 units/molecule. The preferred Si content is about 50% according to the elementary analysis.

The organopolysiloxanes that are described under the designations A-1, A-2, and A-3, on pages 12 to 13 of EP 640643A2, are particularly appropriate.

In accordance with an additional configuration of the invention, the hair treatment products can also, at least, contain one compound selected from the group 1-methoxypropanol(-2), 1-ethoxypropanol(-2), diethylene glycol monomethyl- or ethyl ether, dipropylene glycol monomethyl- or ethyl ether, benzyl alcohol, benzyl oxyethanol, phenyl ethyl alcohol, phenoxy ethanol, and/or cinnamyl alcohol, preferably, in a quantity of 0.1 to 20, particularly, 0.5 to 15, above all, 1 to 12.5 and 2.5 to 10 wt.%, computed based on the overall composition of the product. Preferred compounds from this group are ethoxy diglycol and benzyl oxyethanol.

Additional additives, the type and quantity of which, of course, depends on the form in which the product is applied, are fats, fatty alcohols, emulsifiers, pH regulators, solvents and diluents, solutizers, preservatives, dyes, fragrances, etc.

Appropriate fats and oils which also include waxes, particularly, include natural oils, such as avocado oil, coconut oil, palm oil, sesame oil, peanut oil, sperm oil, sunflower oil, almond oil, peach kernel oil, wheat germ oil, macadamia nut oil, night candle oil, jojoba oil, castor oil, or also olive or soybean oil, lanolin, and its derivatives, as well as mineral oils, such as paraffin oil and vaseline.

Synthetic oils and waxes, for instance, include silicone oils, polyethylene glycols, etc. Additional suitable hydrophobic components, for instance, particularly include fatty alcohols, preferably, those with about 8 to 22 carbon atoms in the molecule, such as myristyl-, cetyl-, stearyl alcohol, wax alcohols and fatty acid esters, such as isopropyl myristat, -palmitate, -stearate, and -isostearate, oleyl oleate, isocetyl stearate, hexyl laurate, dibutyl adipate, dioctyl adipate, myristyl myristat, oleyl erucate, polyethylene glycol, and polyglyceril fatty acid esters, such as PEG-7-glyceryl coocate, cetyl palmitate, etc.

In the compositions in accordance with the invention, these hydrophobic components are preferably contained in a total quantity of about 0.5 to about 10, particularly, about 1 to 7.5, above all, about 1.5 to 5 wt.%, computed based on the overall composition.

In the same manner, other surface-active agents, apart from the above-mentioned quaternary long-chained ammonium compounds,

particularly, amphoteric (zwitterionic) and/or non-ionic tensides, the pertinent use of which is, of course, known to the art, can be used.

An exemplary summary of the production of such products is also found in the already mentioned monograph of K. Schrader, pp 798 to 818, particularly, p. 804 ff.

The hair-conditioning products which are used in accordance with the invention, preferably, are present as an aqueous emulsion, micro-emulsion, dispersion, or opaque, or transparent gel, and may also be finished as aerosols. Such compositions and their production are generally familiar to the expert, and therefore do not require any in depth explanations.

A preferred form of application is products containing anionic or cationic dyes; it has become evident that the combination in accordance with the invention also exerts a color-stabilizing effect on dyed products.

The pH value of the hair treatment products which are used in accordance with the invention is not critical; preferably, it may be from 3 to about 8, particularly, between 4 and 6.5. /4

The following examples serve to illustrate the invention.

Example 1

In a regenerative hair conditioning treatment of composition I,

	wt. %
cetrimonium chloride	2.5
di-C ₁₂ -C ₁₅ -alkyl dimonium chloride	0.6
behenic acid	6.0
benzyloxyethanol	3.5
ethoxy diglycol	5.0
hydroxy ethyl cellulose	0.5
polyquaternium-4	0.2
glycerine	35.0
saccharose	0.5

isopropyl palmitate	0.5
PEG-30/steareth-4 (about 1:1)	1.0
stearic acid	2.0
dimethicone	5.0
dimethicone methyl ether	1.0
fragrance	0.3
sodium hydroxide	0.5
water	ad 100.0

0.5 wt.% of green tea extract (composition I A) were worked in while appropriately reducing the water content.

Both compositions were applied on permanent-waved hair on one half of the hair in a half-side test, and the properties of both halves of the hair were compared after it had been worked in and dried.

Compared to the half of the hair which had been treated with the regenerative hair-conditioning treatment 1, the half of the hair which had been treated with the composition I A in accordance with the invention exhibited a markedly improved combability in the wet and dry states, increased sheen, improved hold, and body.

Example 2

0.8 wt.% saccharose are worked into an emulsion of the composition

II

	wt. %
cetrimonium chloride	3.0
talc trimonium chloride	0.3
benzyl oxy ethanol	2.0
ethoxy diglycol	10.0
behenic acid	6.0
glycolic acid	0.7
hydroxy ethyl cellulose	0.4
isostearyl pentaerythryl glyceryl ether	0.3
glycerine	30.0
green tea extract	0.5
polyquaternium-7	0.3
PEG-30/steareth-4 (about 1:1)	1.5
trideceth-12	0.4

stearic acid	2.0
fragrance	0.5
dimethiconol	0.4
amodimethicone	0.3
sodium hydroxide	1.2
✓wheat germ oil	0.3
water	ad 100.0

while appropriately reducing the water content (composition II A).

A markedly improved conditioning effect was realized in the half-side test with the composition II A compared to the composition II.

Example 3

/5

Leave-on Lotion

	wt. %
distearyl dimethyl ammonium chloride	0.6
amodimethicone	2.0
amino acids (L-arginine + D-glucosamine.HCl)	0.5
polyquaternum-11	0.3
pyrrolidone-2-carboxylic acid, sodium salt	0.2
citric acid	0.2
lactic acid	0.1
glyoxylic acid	0.5
saccharose	0.3
green tea extract	0.5
fructose	0.3
PEG-40, hydrated castor oil	0.3
panthenol	1.0
tocopherol acetate	0.1
fragrance	0.3
preservatives	0.3
water	ad 100.0

Example 4

Hair rinse

	wt. %
cetyl stearyl alcohol	1.0
almond oil	0.50
PEG-7 glyceryl cocoate	0.50
hydroxyl ethyl cellulose	1.00
saccharose	0.50
benzophenone-4	0.30

green tea extract	0.50
dimethicone copolyol beeswax	0.80
decyl glucoside	0.50
1,2-propylene glycol	1.00
dimethicone	0.20
behenic trimonium chloride	0.40
fragrance	0.30
preservatives (parabene)	0.20
yellow colorant C.O.-No. 47,005	0.0003
red colorant C.O.-No. 14,700	0.0009
water	ad 100.0

Comparison Test

A composition IV in accordance with Example 4 was applied on one half of the hair in a half-side test and, compared to the other half of the hair which had been treated with an otherwise identical composition IV A that, instead of saccharose, contained the same percentage of behenic trimethyl ammonium chloride, on 10 test subjects; the following parameters were manually and visually determined after a one-time good-equal-bad evaluation by two hair stylists.

Result

Preference	Composition IV	Equal	Composition IV A
wet combability	14	4	2
wet feel	11	8	1
dry combability	15	3	2
dry feel	16	4	0
fullness (volume, body)	13	3	3
sheen	18	1	1

This results in the clear preference for the composition in accordance with the invention.

At the same time, a color stability test was conducted at room temperature, whereas the original composition IV in accordance with Example 4 was compared with an otherwise identical composition IV A that, however, did not contain any saccharose and no green tea extract, after a storage period of one, two, and three months.

It was evident that, after one month of storage, a visible difference could already be noted; after 3 months, the color of the composition IV A had clearly faded compared to that of the composition IV which proved to be markedly more color-stable.

Patent Claims

1. Use of a hair treatment product on an aqueous basis, containing
 - a) at least, one mono- and/or oligosaccharide, and
 - b) green tea extract.
2. Use of a product in accordance with Claim 1, containing 0.1 to 10 wt.% of green tea extract, computed based on the dry mass of the overall composition of the product.
3. Use of a product in accordance with Claim 1 or 2, containing 0.1 to 10 wt.% of, at least, one mono- and/or oligosaccharide.
4. Use of a product in accordance with any of the Claims 1 or 3, containing a cationic polymer.
5. Use of a product in accordance with one or several of the Claims 1 to 4, containing, at least, one quaternary ammonium compound with, at least, one C₁₀-C₂₂-alkyl or alkenyl group.

6. Use of a product in accordance with one or several of the Claims 1 to 5, containing, at least, one anionic or cationic colorant.